

REMARKS

Claim 1 has been amended to reincorporate recitations that were deleted in the last amendment and to add a recitation based on the disclosure at page 15, lines 20-21.

Entry of the above amendment is respectfully requested.

Obviousness Rejections

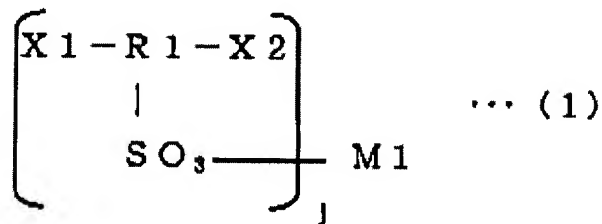
Claims 1, 3, 5, 8, and 21-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over European Patent Publication EP 821,086 (the publication) in view of Shizuki et al., 4,600,743 (Shizuki). Claims 9 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over European Patent Publication EP 821,086 (the publication) in view of Shizuki et al., 4,600,743 (Shizuki) as applied above to claims 1, 3, 5, 8 and 21-23, and further in view of Azuse et al., 2003/0024052 (Azuse). Claims 1, 3, and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shizuki et al., 4,600,743 (Shizuki) as applied above to claims 1, 3, and 5. Claims 8 and 21-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shizuki et al., 4,600,743 (Shizuki) as applied above to claims 1, 3, and 5, in view of European Patent Publication EP 821,086 (the publication), as applied above to claims 1, 3, 5, 8 and 21-23. Claims 9-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shizuki et al., 4,600,743 (Shizuki) as applied above to claims 1, 3, and 5, in view of Azuse et al., 2003/0024052 (Azuse), as applied above to claims 9 and 10.

Applicants respectfully submit that the invention as recited in the amended claims is not obvious over the cited art, and request that the Examiner reconsider and withdraw these rejections in view of the following remarks.

Initially, Applicants submit that the present invention as claimed in amended claim 1 is constituted from the following features.

1. In the present invention, it is important that the elastic fiber has a coefficient of moisture absorption of not less than 5 % at 35°C and at a RH of 95 % and a coefficient of water absorption extension of not less than 10 %. Thereby, a woven or knitted fabric comprising such an elastic fiber is a fabric giving excellent comfortableness and having the so-called self-adjusting function wherein when the woven or knitted fabric absorbs sweat or the like, the fibers are extended to open the stitches of the woven or knitted fabric to release moisture in the clothing, and when the woven or knitted fabric is dried, the fibers are contracted into their original length, thereby clogging the stitches of the woven or knitted fabric to prevent the release of temperature in the clothing. (See page 6, lines 9-19 in the present application.)

2. The above-mentioned high coefficient of moisture absorption and the above-mentioned high coefficient of water absorption extension can easily be achieved by copolymerizing the above-mentioned polyether ester elastomer with a metal organic sulfonate represented by the following general formula (1) and controlling the intrinsic viscosity of the elastic fiber to not less than 0.9. (See page 9, lines 13-24 in the present application.)



3. As mentioned above, it is preferable that the elastic fiber comprises the above-mentioned polyether ester elastomer, and has an intrinsic viscosity of not less than 0.9. When the above-mentioned intrinsic viscosity is not less than 0.9, the extremely high coefficient of

moisture absorption and the extremely high coefficient of water absorption extension can be realized, and a fabric giving excellent comfortableness can easily be obtained. On the other hand, when the intrinsic viscosity is too large, the fiber productivity of the polymer is not only deteriorated, but the cost for producing the fiber is also increased. Therefore, it is more preferable that the intrinsic viscosity is in a range of 0.9 to 1.2. (See page 15, lines 12-21 in the present application.)

Turning now to the cited art, Applicants have the following comments.

A. European Patent Publication EP 821,086 (the publication)

The publication discloses a polyether ester elastic fiber. However, polybutylene terephthalate is only explained with the example of the hard segment, and polyoxyethylene glycol is only explained with the example of the soft segment. Also, in the publication, Examples 1-13 disclose a polyether ester copolymer prepared by copolymerizing a terephthalic acid component, a tetramethylene glycol (hard segment) and a poly (tetramethyleneoxide) glycol (soft segment) having an intrinsic viscosity of 1.35, and Example 14 discloses the polyether ester copolymer fiber prepared by copolymerizing a dimethyl terephthalate component, a tetramethylene glycol (hard segment) and a poly (tetramethyleneoxide) glycol (soft segment) having an intrinsic viscosity of 1.35.

In addition, Applicants found that a polyether ester elastic fiber comprising a polyether ester elastomer containing polybutylene terephthalate as a hard segment and polyoxyethylene glycol as a soft segment, especially when copolymerized with a metal organic sulfonate represented by the general formula (1), surprisingly increases in fiber length of not less than 10% when absorbing water (it is not stretched) and keeps the intrinsic viscosity from 0.9 to 1.2.

In contrast, a generic polyether ester elastic fiber comprising a polyether ester elastomer containing polybutylene terephthalate as a hard segment and polyoxyethylene glycol as a soft segment, and also a polyether ester elastic fiber including a poly (tetramethyleneoxide) glycol as a soft segment (Example 1-14 in the publication), does not increase the fiber length when absorbing water, because both the hard segment and soft segment are hydrophobic, unlike polyether ester elastic fibers having hydrophilic properties (see page 6, line 9-19 in the present application).

Accordingly, Applicants submit that the publication does not teach or suggest the polyether ester elastic fiber comprising a polyether ester elastomer containing polybutylene terephthalate as a hard segment and polyoxyethylene glycol as a soft segment of the present invention giving a fabric a good moisture-absorbing property and being reversibly largely expanded or contracted by the absorption or release of water to exhibit excellent comfortableness.

B. Shizuki et al., 4,100,743 (Shizuki)

Shizuki discloses an antistatic fiber, which is entirely different from the present invention, obtained by melt spinning of fiber-forming thermoplastic polymer containing at least one of polyoxyalkylene glycol and its derivatives and treated with a weight decreasing agent and provides a number of streaks arranged in parallel in lengthwise direction at the surface. Shizuki only teaches the thermoplastic polymer is dyeable with a basic dye which comprises at least one ester-forming group and organic sulfonate as an optional component, such that a fiber excellent in antistatic and wicking property can be obtained.

Accordingly, Shizuki does not teach which polymer should be chosen to obtain a fiber which extend not less than 10 % in length by absorbing water (even if the polymer contains the organic sulfonate).

In addition, the examples disclose only a polymer having an intrinsic viscosity of 0.410 to 0.640.

Thus, Applicants submit that Shizuki does not hinder the unobviousness of the present invention.

C. US 2003/0024052 A1 (Azuse)

Azuse discloses a finishing oil for mainly hydrophobic elastic fibers to enhance their antistatic property and prevent the fibers from tacking with one another during processing. However, Azuse does not teach an polyether ester elastomer copolymerized with a metal organic sulfonate.

Thus, Applicants submit that Azuse does not hinder the unobviousness of the present invention.

D. Combination of EP 0821086, Shizuki and Azuse

None of EP 0821086, Shizuki and Azuse teach or suggest that the polyether ester elastic fiber comprising a polyether ester elastomer containing polybutylene terephthalate as a hard segment and polyoxyethylene glycol as a soft segment, and the polyether ester elastomer copolymerized with a metal organic sulfonate represented by the general formula (1) and having an intrinsic viscosity of the elastic fiber is 0.9 to 1.2 gives a coefficient of water absorption extension of not less than 10%, and the polyether ester elastic fiber gives a fabric having a good moisture-absorbing property and is reversibly largely expanded or contracted by the absorption or release of water to exhibit excellent comfortableness.

Even more, the cited references do not teach that a woven or knitted fabric comprising the aforementioned elastic fibers has the so-called self-adjusting function wherein when the fabric absorbs sweat, the fibers are extended to open the stitches of the fabric to release moisture in the clothing, and when the fabric is dried, the fibers are contracted to their original length, thereby clogging the stitches of the fabric to prevent the release of temperature in the clothing.

Accordingly, Applicants submit that the cited references alone or in combination do not hinder the unobviousness of the present invention, and thus withdrawal of these rejections is respectfully requested.

Conclusion

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

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